

ABSTRACT

The present invention is intended to provide novel genes participating in acetic acid tolerance of acetic acid bacteria, and a method of improving acetic acid tolerance of microorganisms, particularly that of acetic acid bacteria by using the genes, further a method of efficiently producing vinegar with acetic acid at higher concentration by using acetic acid bacteria whose acetic acid tolerance is improved. In the present invention, novel genes having a function for improving acetic acid tolerance on practical level were cloned from practical acetic acid bacteria belonging to the genus *Gluconacetobacter* by a method of obtaining genes from chromosomal DNA library that enable to grow on the medium at a high concentration of acetic acid. Further, in transformants in which the genes were introduced into acetic acid bacteria, acetic acid tolerance was remarkably increased, and when the transformants are subjected to aeration culture in the presence of ethanol, the growth lag-time can be shortened, and the growth rate can also be improved, moreover the final acetic acid concentration can be remarkably improved.